2005 Virginia Interoperability Communications Conference

October 4-5, 2005 Virginia Beach, Virginia

Welcome and Introductions

The Honorable John Marshall

Virginia Secretary of Public Safety

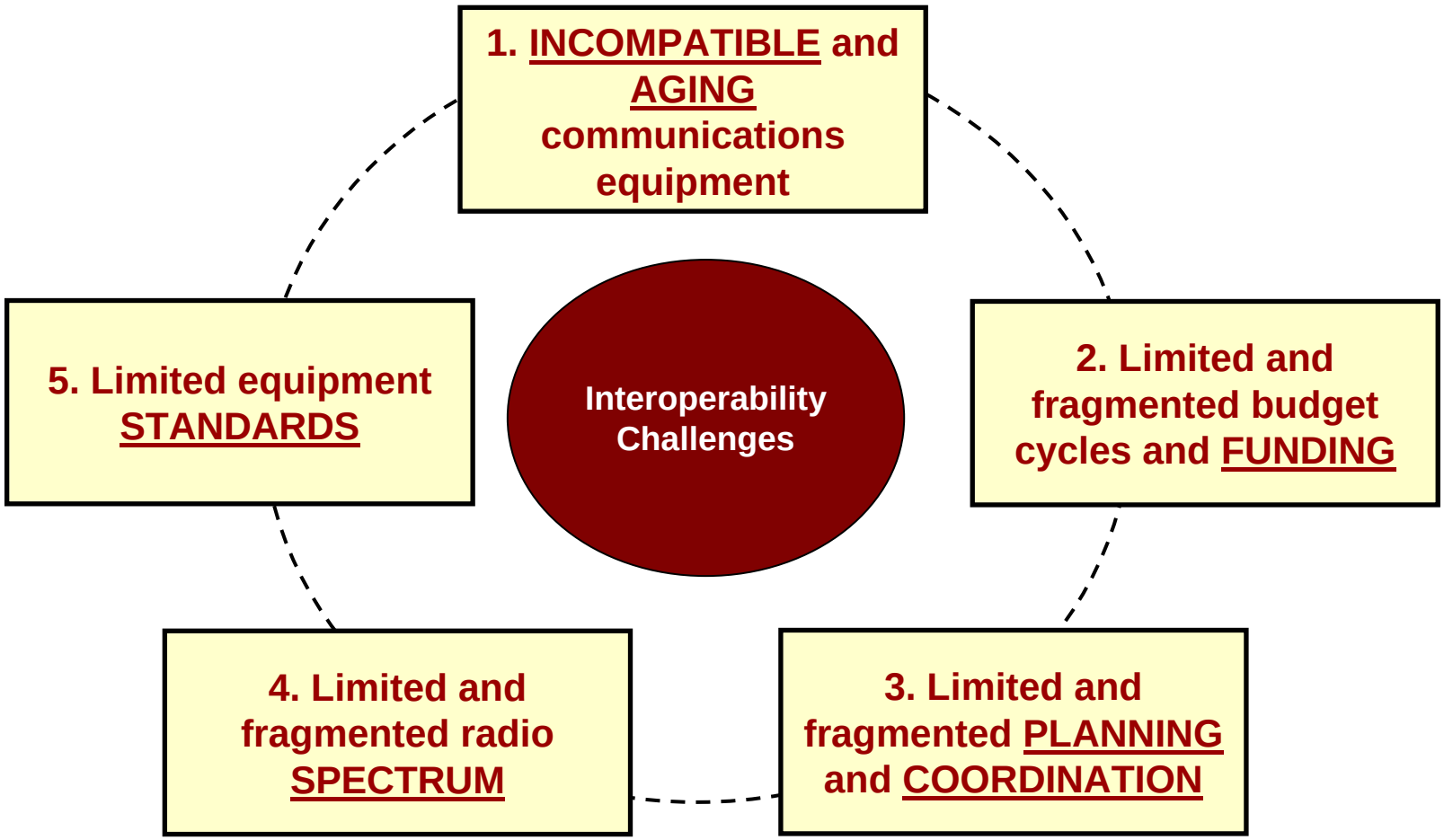
Improving Public Safety Wireless Communications and Interoperability

What is Interoperable Communications?

Wireless interoperability is the ability of public safety service and support providers to talk with each other via voice and data

- on demand
- in real time
- when needed
- when authorized

Current Challenges of Interoperability



These five issues were identified by the National Task Force on Interoperability in its February 2003 final report, Why Can't We Talk? Working Together to Bridge the Communications Gap to Save Lives.

The SAFECOM Program

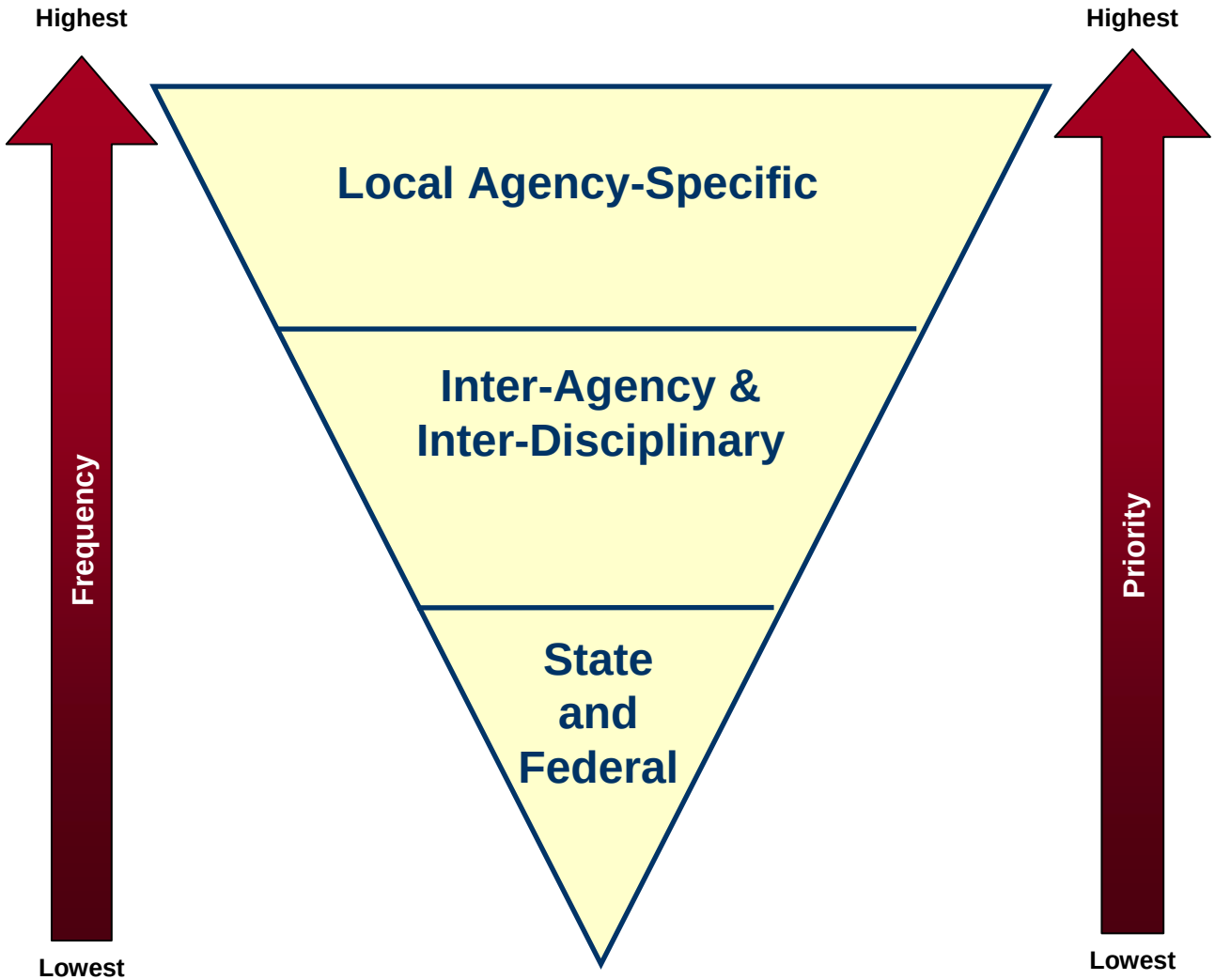
SAFECOM, a communications program of the Office for Interoperability and Compatibility (OIC), provides research, development, testing, and evaluation, guidance, and assistance for local, tribal, state, and federal public safety agencies working to improve public safety response through more effective and efficient interoperable wireless communications.

- SAFECOM is a public safety practitioner-driven program that works cooperatively with more than 50,000 local and state public safety agencies.

- SAFECOM makes it possible for the public safety community to leverage resources by promoting coordination and cooperation across all levels of government.

With its partners, SAFECOM is working to ensure a safer America through effective public safety communications.

Practitioner-Driven Approach

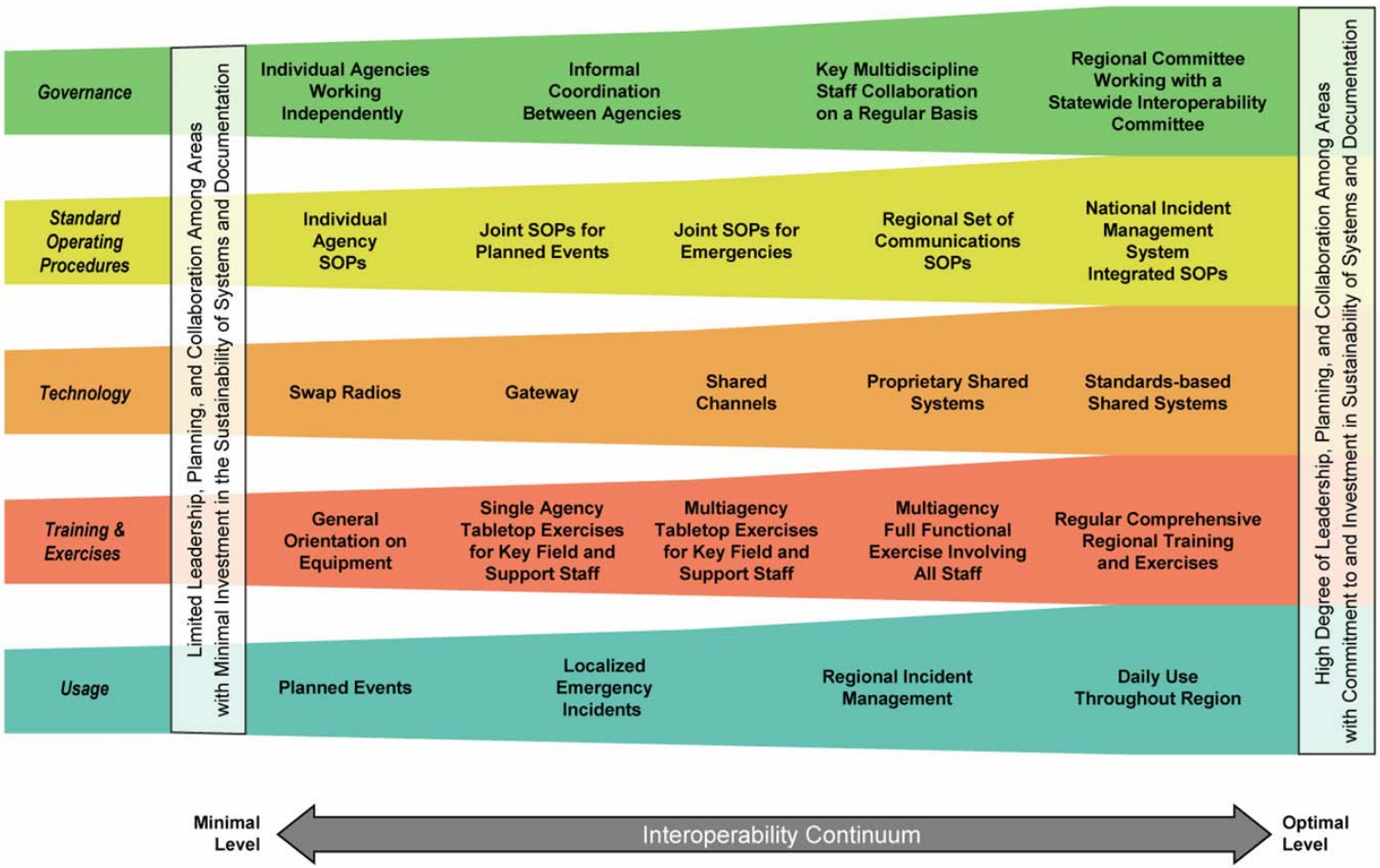


Achievements

Interim frameworks supporting the priority include:

- Interoperability Continuum
- Common Federal Grant Guidance
- Public Safety Statement of Requirements (SoR)
- Lifecycle Approach to Accelerate Standards
- Statewide Communications Interoperability Planning (SCIP) Methodology

Communications Interoperability Continuum



Guidance for Interoperability

Grant Guidance

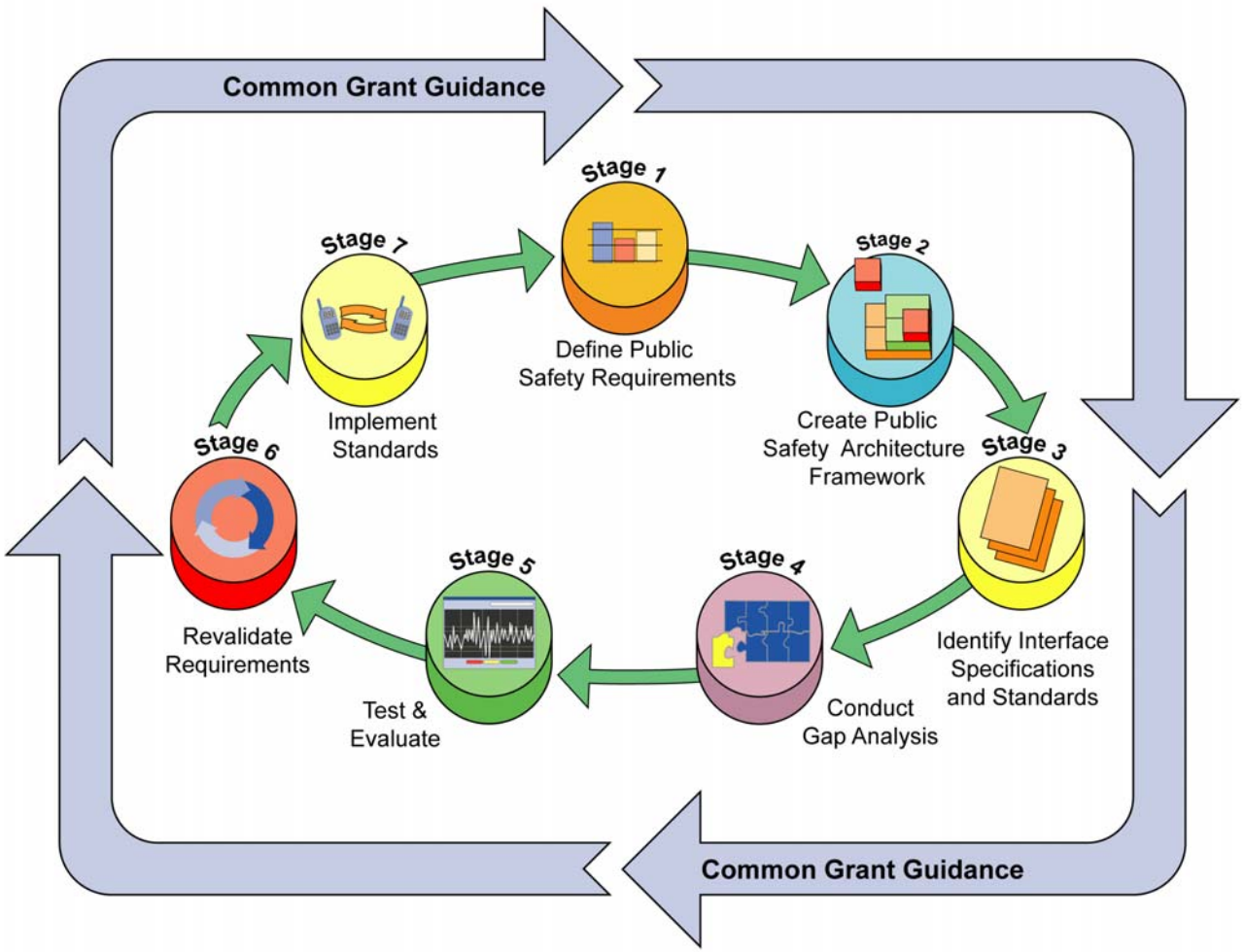
- SAFECOM has provided common grant guidance to Federal agencies to assist in planning and implementing the community's interoperability solutions. Grant guidance provides Federal grant dollar criteria to avert the creation of public safety communications systems stovepipes at the local and state levels.

Statement of Requirements (SoR)

- Created to identify a basic set of functional and technological interoperable communications requirements for public safety first responders from all disciplines in all jurisdictions to communicate and share information.
- Focus is initially on public safety first responders, i.e. Law Enforcement, Fire, EMS.
  - Future versions will engage other stakeholders, i.e. Tribal, Federal, supplemental responders, and other agencies
  - Currently working on v1.1 to include additional functional requirements

Standards and Technology

Lifecycle Approach



SCIP Methodology

SAFECOM recently released the Statewide Communications Interoperability Planning (SCIP) Methodology, a tool that outlines a step-by-step planning process for developing a locally-driven, statewide strategic plan to enhance communications interoperability. The SCIP methodology is the result of a collaboration between SAFECOM and the Commonwealth of Virginia in its development of a strategic plan for improving statewide interoperable communications.

Lessons Learned: SCIP One Year Later

Goals of Lessons Learned Document:

- Revisit Virginia's strategic planning efforts to identify successes and challenges
- Fuel the best practices model (SCIP) for planning for communications interoperability
- Enable other states to learn from Virginia's experience as they plan for communications interoperability and begin implementing initiatives

Ongoing Initiatives

- Develop standardized tools and methodologies
- Pilot tools and methods as national models at the rural, urban, state, and/or regional levels
- Create a baseline of public safety communications interoperability for first responders
- Accelerate the development of standards
- Publish a national public safety architecture framework
- Implement a coordinated RDT&E program for public safety

QUESTIONS?

Contact Us

www.safecomprogram.gov

1-866-969-7233

FY 2005 Accomplishments

Chris Essid

Commonwealth Interoperability Coordinator

2005 Accomplishments

- Virginia named a “best practices” model for statewide interoperability planning by the Department of Homeland Security and SAFECOM

- Hired a full-time Commonwealth Interoperability Coordinator

2005 Accomplishments

- Developed the Strategic Plan for Statewide Communications Interoperability

- Established a governance structure to coordinate interoperability

- State Interoperability Executive Committee was designated as the reviewing body for the recommendations on interoperability grant funding

2005 Accomplishments

- Hosted a Statewide Interoperable Communications Conference
- Distributed $1.7 million in local interoperability grants
- Distributed $460,500 for local interoperability demonstration projects

2005 Accomplishments

- Assisted the Virginia Beach Metropolitan Statistical Area (MSA) in obtaining a $6M FY 2004 COPS interoperability grant
- Developed an Interoperability Website and Listserv
- Established the requirement for the annual update of the Strategic Plan

2005 Accomplishments

QUESTIONS?

Break

The FY 06 Commonwealth of Virginia Strategic Plan for Statewide Communications Interoperability

State Interoperability Executive Committee

Overview

- The Strategic Plan must be updated annually
- July 29th, 2005 – Advisory Group reviewed FY 05 Statewide Plan initiatives and provided recommendations to the SIEC for FY 06
- August 19th, 2005 – The SIEC reviewed the recommendations and created a final FY 06 Statewide Plan for consideration
- September, 2005 – FY 06 Statewide Plan approved by the Governor

Mission

Improve public safety in the Commonwealth of Virginia through enhanced data and voice communications interoperability between local, regional, state, and federal agencies.

Vision

By 2015, agencies and their representatives at the local, regional, state, and federal levels will be able to communicate using compatible systems, in real time, across disciplines and jurisdictions, to respond more effectively during day-to-day operations and major emergency situations.

Goal 1: Communications Interoperability is a high priority for the Commonwealth

- **Initiative 1 – Develop, distribute and promote interoperability information.**

- **Initiative 2 – Institutionalize a program management office (PMO) to support interoperable communications efforts in the Commonwealth.**

Goal 2: Common language and coordinated protocols and standards are used statewide

- **Initiative 3 – As defined by NIMS, identify and adopt common language protocols in the Commonwealth for day to day operations and major emergency situations**

- **Initiative 4 – Develop and promote technical standards and operational protocols**

Goal 3: Interoperability capabilities are maximized by using existing and or future communications systems and technologies

- **Initiative 5 – Develop recommendations to VITA on what interoperable communications equipment and services need to be included in state contracts**
- **Initiative 6 – Promote the use of local, regional, state and federal mutual aid channels to foster interoperable communications**
- **Initiative 7 – Coordinate and assist localities and regions with the 800 MHz rebanding process mandated by the FCC**
- **Initiative 8 – Develop the Statewide 700 MHz plan and assist with implementation**

Goal 4: Training is provided to enhance effective use of communication systems

- **Initiative 9 – Conduct training sessions for state interoperability grant recipients as appropriate**
- **Initiative 10 – Develop a lessons learned clearinghouse**

Challenges

- **Inadequate resources to implement the initiatives**
- **Inadequate and inconsistent funding to jurisdictions**
- **Separate and disparate local initiatives exist**
- **Inability to direct standard communications interoperability solutions**
- **Lack of awareness and priority around communications interoperability**
- **Incompatible equipment and systems**

Overcoming the Challenges

Challenges	Goal #1	Goal #2	Goal #3	Goal #4
Inadequate Resources	☑			
Inadequate and inconsistent funding	☑		☑	
Disparate Local Initiatives	☑	☑	☑	☑
Broad Flexibility	☑	☑	☑	☑
Lack of Awareness and Priority	☑			
Incompatible Equipment			☑	☑

FY 2006 Strategic Plan

Broadening our Network of Practitioners

Columbine Interoperability Lessons

William Pessemier
Executive Communications Systems Advisor
International Association of Fire Chiefs

A Strategic Perspective on Interoperability

Getting the right resources, to the right place, at the right time

IAFC Presentation Outline

- **Case Study: The Shootings at Columbine High School**
- **Lessons Learned and Problems Shared**
- **Understanding Interoperability**
- **How Interoperability Supports Command and Control**
- **Barriers to Interoperability**
- **Why Interoperability is Important**
- **Regional Planning for Interoperability**
- **TAKE ACTION NOW**


GYM AREA
MAIN OR NORTH HALL
SCIENCE AREA UPPER LEVEL
LIBRARY UPPER LEVEL
CAFETERIA LOWER LEVEL
KLEBOLD VEHICLE
HARRIS VEHICLE


COLUMBINE LIBRARY
BOWLES AVENUE
LEAWOOD ELEMENTARY
CLEMENT PARK
PIERCE AVENUE
COLUMBINE HIGH SCHOOL

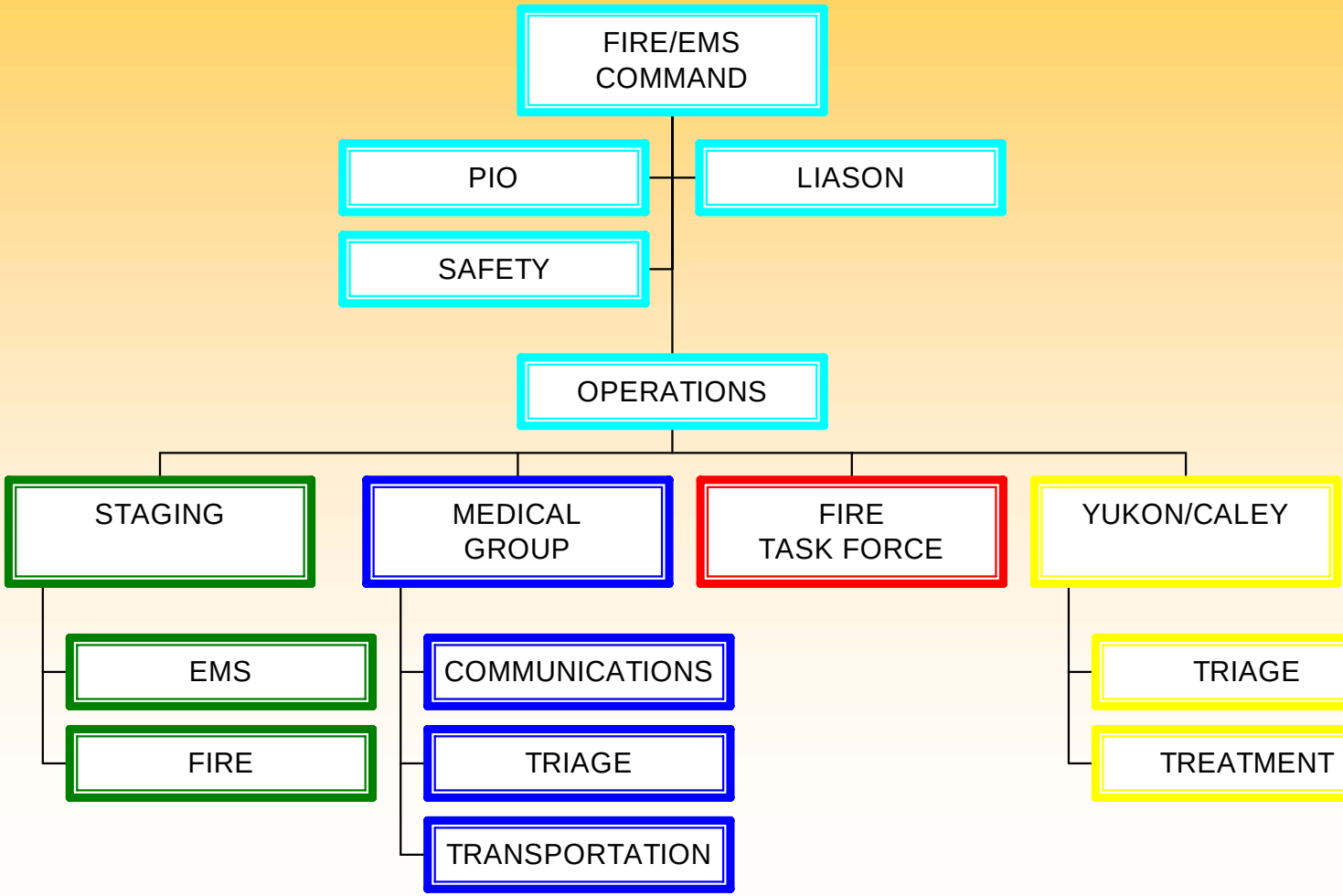

STAGING
LEAWOOD/PIERCE
COLUMBINE
LIBRARY
COMMAND
POST
STAGING
PIERCE/WEAVER

Early Interoperability Problems

- **Self-dispatch and off-duty response**
- **Communications system overload**
- **Incomplete, conflicting, ambiguous, and old information**
- **Limited situational awareness**
- **Minimal Command and Control**
- **Fire/EMS personnel under fire**


SHERIFF

Secondary Incident Command Structure
12:18 pm




COMMAND POST
STAGING LEAWOOD/PIERCE
COLUMBINE LIBRARY
LEAWOOD ELEMENTARY
EMS STAGING
MAIN TRIAGE MEDICAL GROUP
HELICOPTER LZ
YUKON/CALEY DIVISION
FIRE TASK FORCE

Unified Command Strategic Objectives

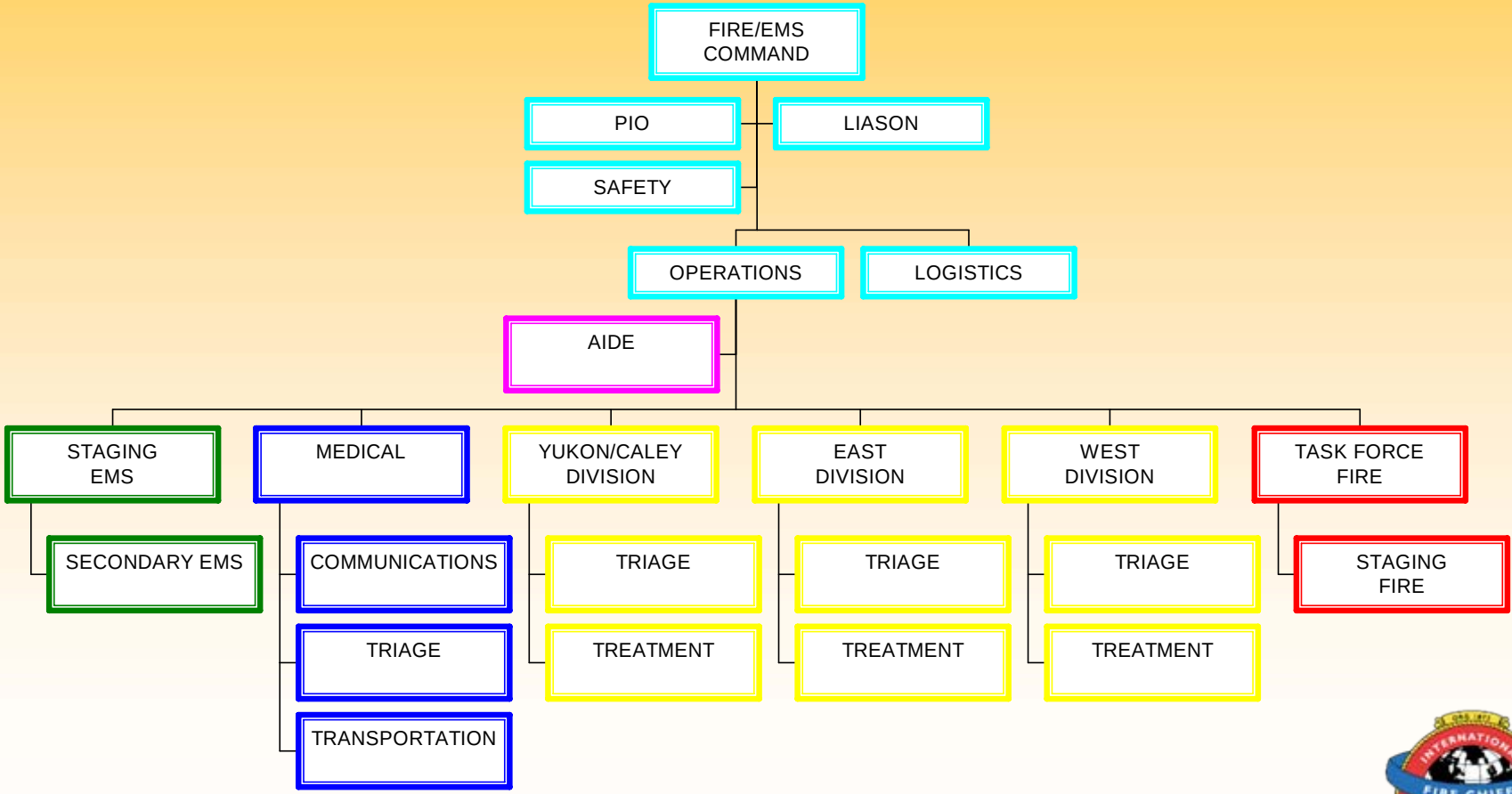
- **Secure the perimeter**
- **Locate/eliminate shooters**
- **Reach the wounded inside/outside of school**
- **Transport wounded to triage areas**

- **Treat and transport to medical facilities**
- **Coordinate patient transport with local hospitals**


Rodolfo Gonzalez/News Photo


SHERIFF

Final Incident Command Structure
1:30 pm



Communications and Resource Management Problems

- **Command Staff and Triage Areas**
- **Triage Areas and Law Enforcement**
- **Controlling Resources at Staging**
- **Sending Directions, Receiving Reports**
- **IC and EOC**

IAFC Incident Summary

- Improvised Explosive Devices
- Small Arms Fire
- Multiple Casualties
- First Responders Taking Fire
- Structure Fire
- Crime Scene

- 188 Shots Fired by Harris and Klebold
- 141 Shots Fired by Law Enforcement
- 89 Improvised Explosive Devices
- 15 Killed
- 160+ Triaged
- 24 Transported

Joint Operations: Total Response

- **FIRE**
  - 6 Departments
  - 166 Personnel
- **EMS**
  - 7 Agencies
  - 80 Personnel
- **LAW ENFORCEMENT**
  - 28 Agencies
  - Over 900 Personnel

Lessons Learned and Problems Shared

- **Large/Complex Incidents**
  - Radio Channel Congestion
  - Communications System Overload
  - Loss of Infrastructure
  - Limited Command and Control
  - Low Levels of Coordination
  - Slow Response
  - Low Situational Awareness
  - Wasted Resources
  - Increased Casualties
- **Why do the same problems keep recurring?**

Understanding Interoperability

- **Operational– working together**
  - Involves cooperation and collaboration across jurisdictions, disciplines and levels of government.
  - Operational interoperability requires teamwork in the exchange of all critical services.
- **Technical– talking to each other**
  - Involves communication and exchange of information across jurisdictions, disciplines and levels of government.
  - Requires multi-channel, multi-system operations

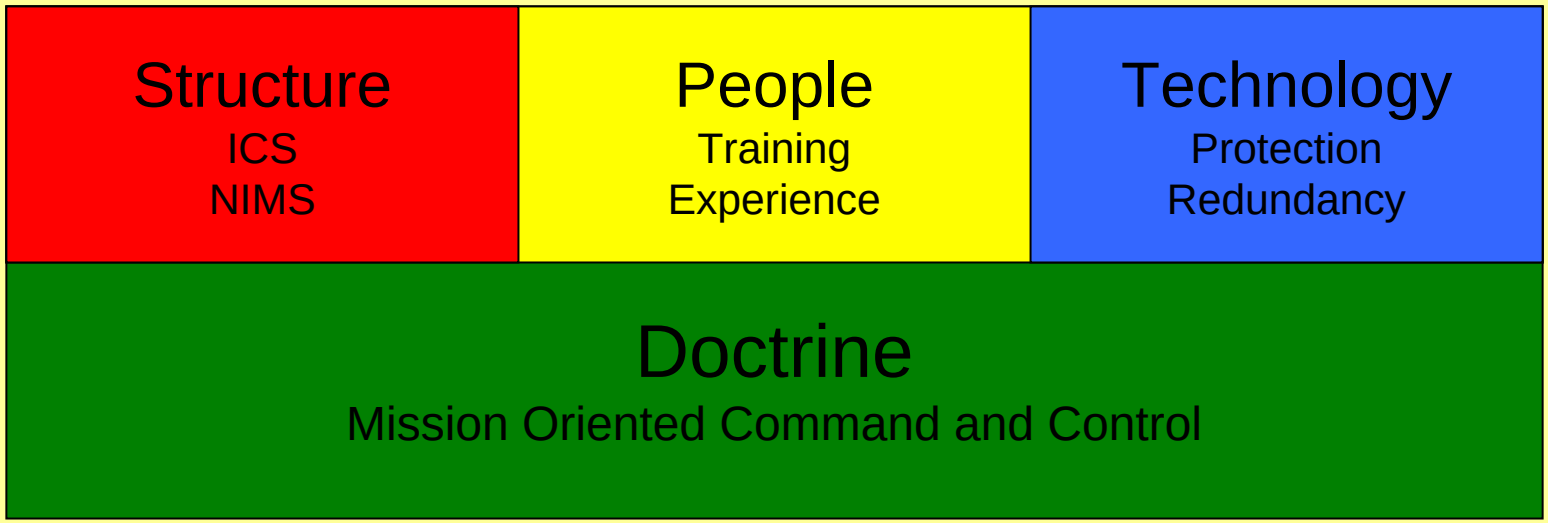
IAFC Cont.

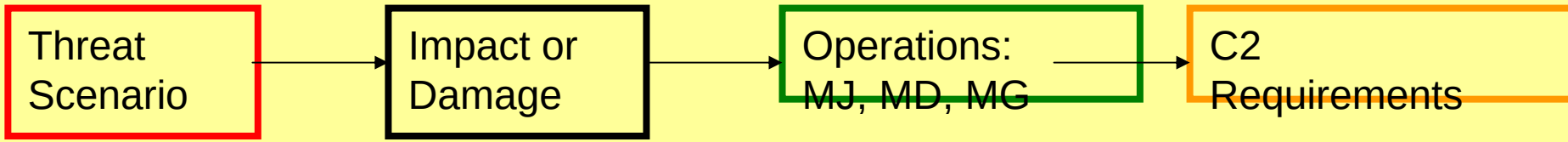
- **2 Sides of the Same Coin**
  - Operational Interoperability
  - Technical Interoperability
- **<u>Both</u> are required for effective and efficient multi-jurisdictional (MJ), multi-disciplinary (MD), and multi-governmental (MG) response**

Principles of Interoperability

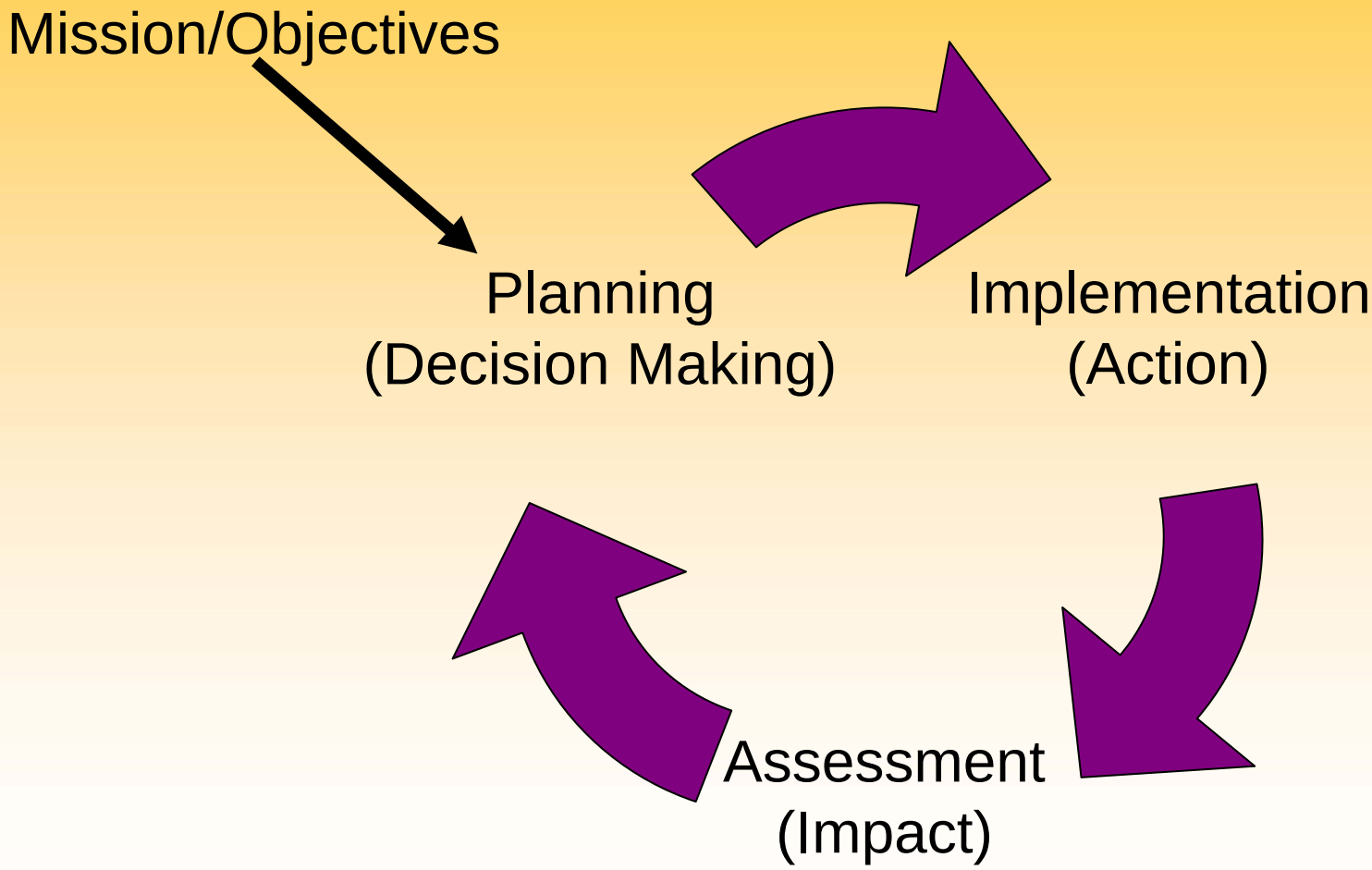
- **Operational Needs as the Driving Force**
- **Regionalized Planning and Implementation**
- **Leadership Commitment to Joint Operations Strategy**
- **Funding and Resources**
- **Accept the 80% Solution**
- **Leverage Commercial Technology**

Understanding Command and Control





Command and Control Process



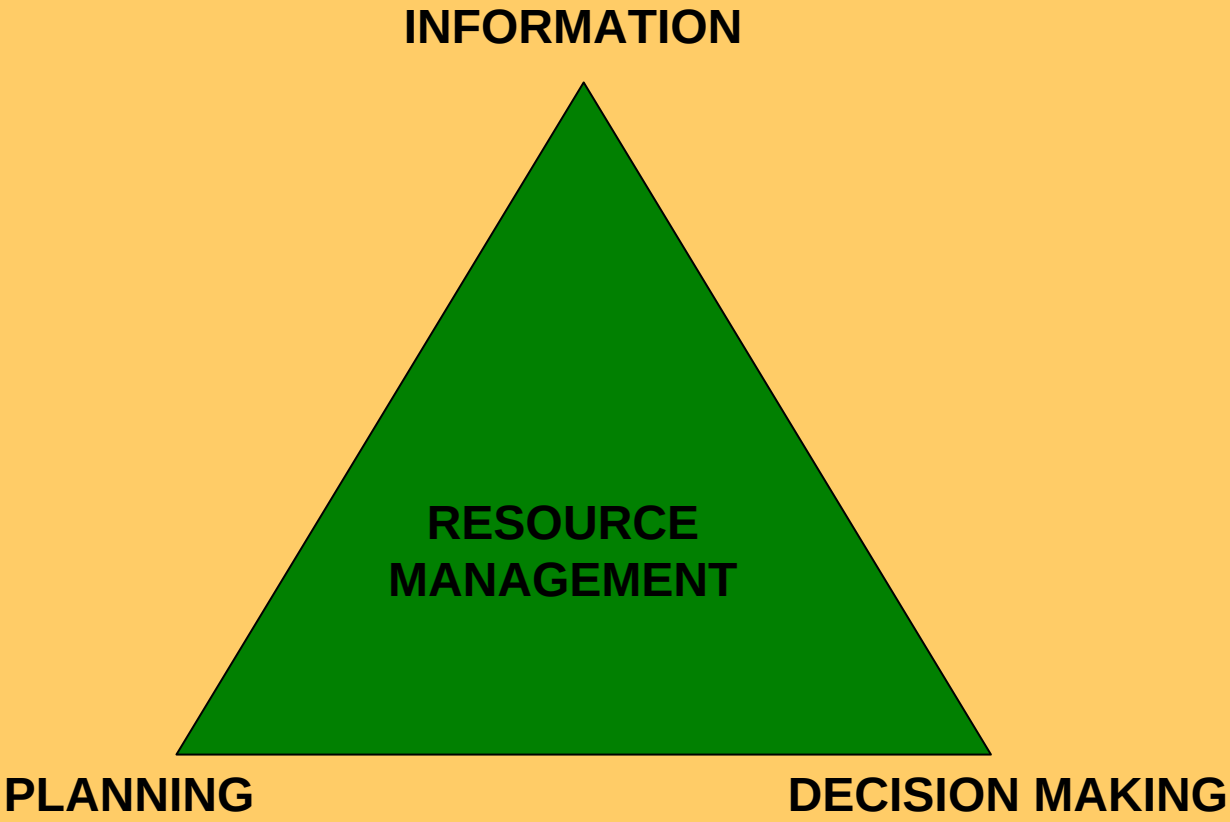
IAFC Cont.

- **Continuous process**
- **Provides Unity of Command and Direction for multi-level response**
- **Provides a framework for improvisation and independent action that contributes to the effectiveness of operations**
- **Drives Structure, Personnel, and Technology towards accomplishing the mission**

The Barriers to Interoperability

- **Financial**
  - Limited Resources
  - Competing Priorities
- **Technical**
  - Obsolete Equipment
- **Cultural**
  - Competition
  - Territorialism
  - Self-Sufficiency
- **Are we trying to solve the wrong problem?**

Interoperability, Command and Control



If you can overcome the barriers to interoperability, you will be able to get the right resources, to the right place, at the right time.

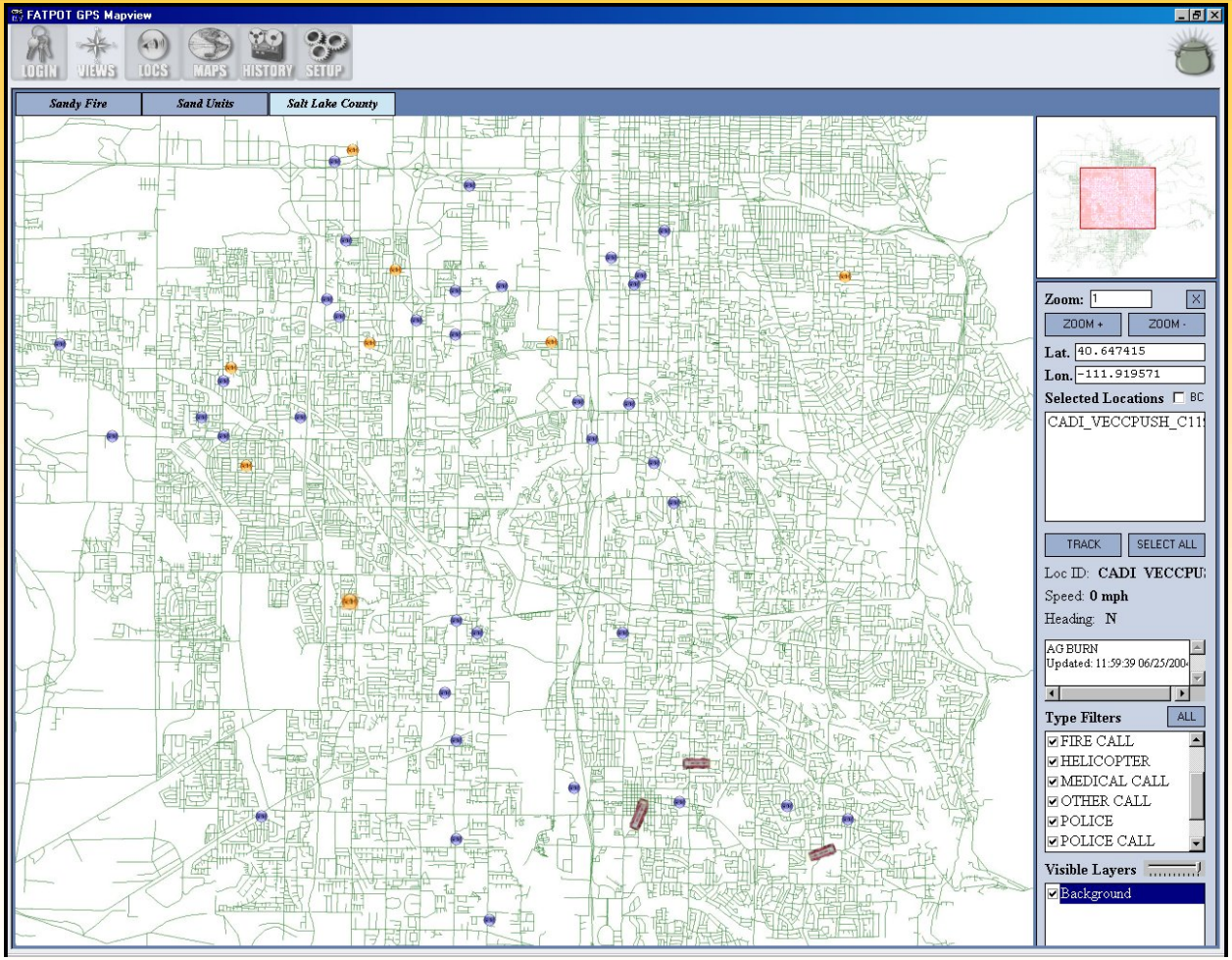
IAFC Technology and C2

- **High Technical Support**
  - Faster Cycle
  - More Coordinated Resource Management
  - High Level of Situational Awareness
- **Low Technical Support**
  - Slower Cycle
  - Less Coordinated Resource Management
  - Low Level of Situational Awareness

IAFC cont.

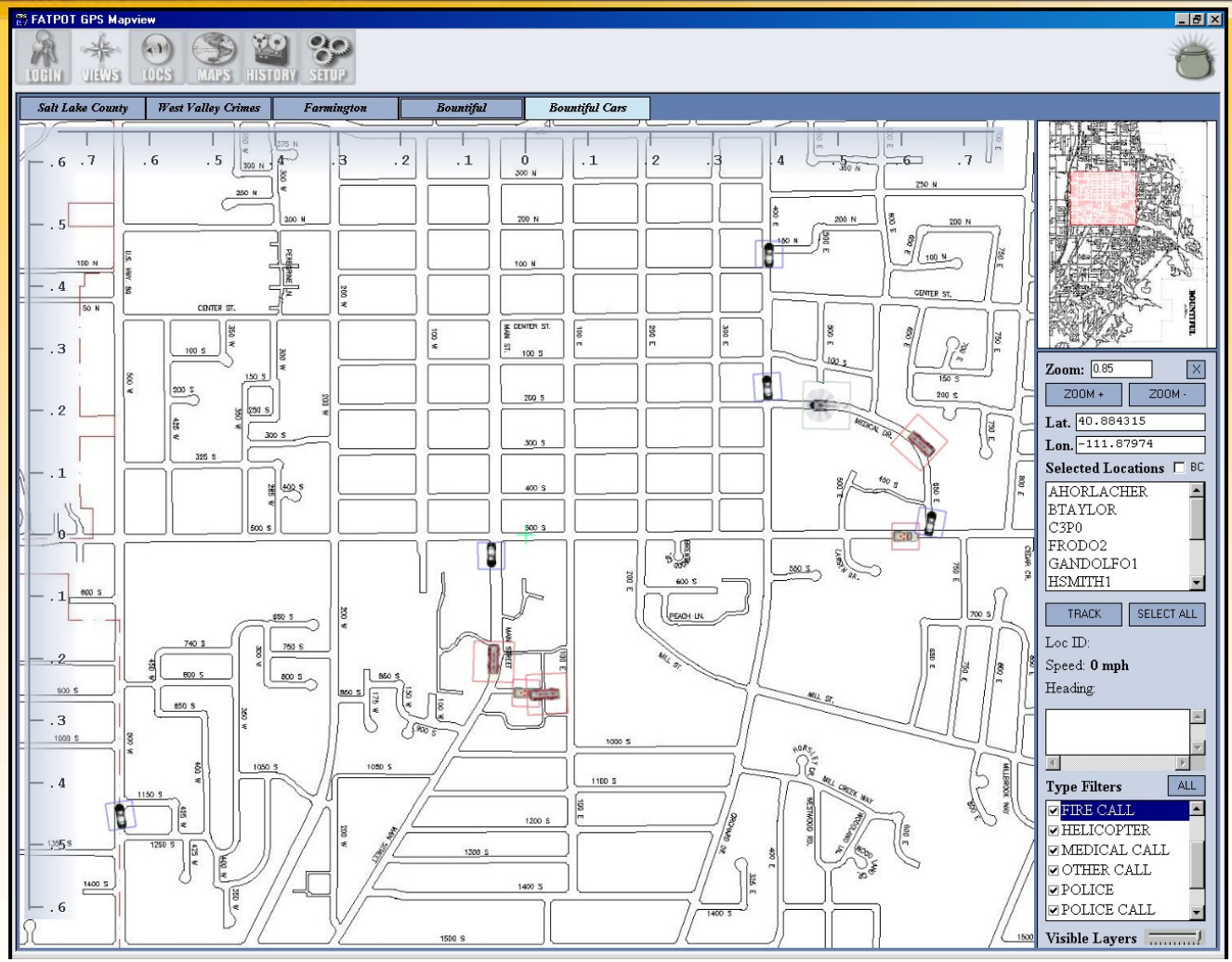
- **Information exchange, voice and data options**
  - Private LMR, Commercial Networks, 2 Way Messaging, Handheld GPS, Interconnect Systems, Satellite
- **Range?**
  - Personal, Short Range, Long Range
- **Situational Awareness/Information Display**
  - What is happening, what impact are we having?
- **Resource Management/Tracking**
  - What resources are available, what capabilities do they have?

FATPOT - MAPView



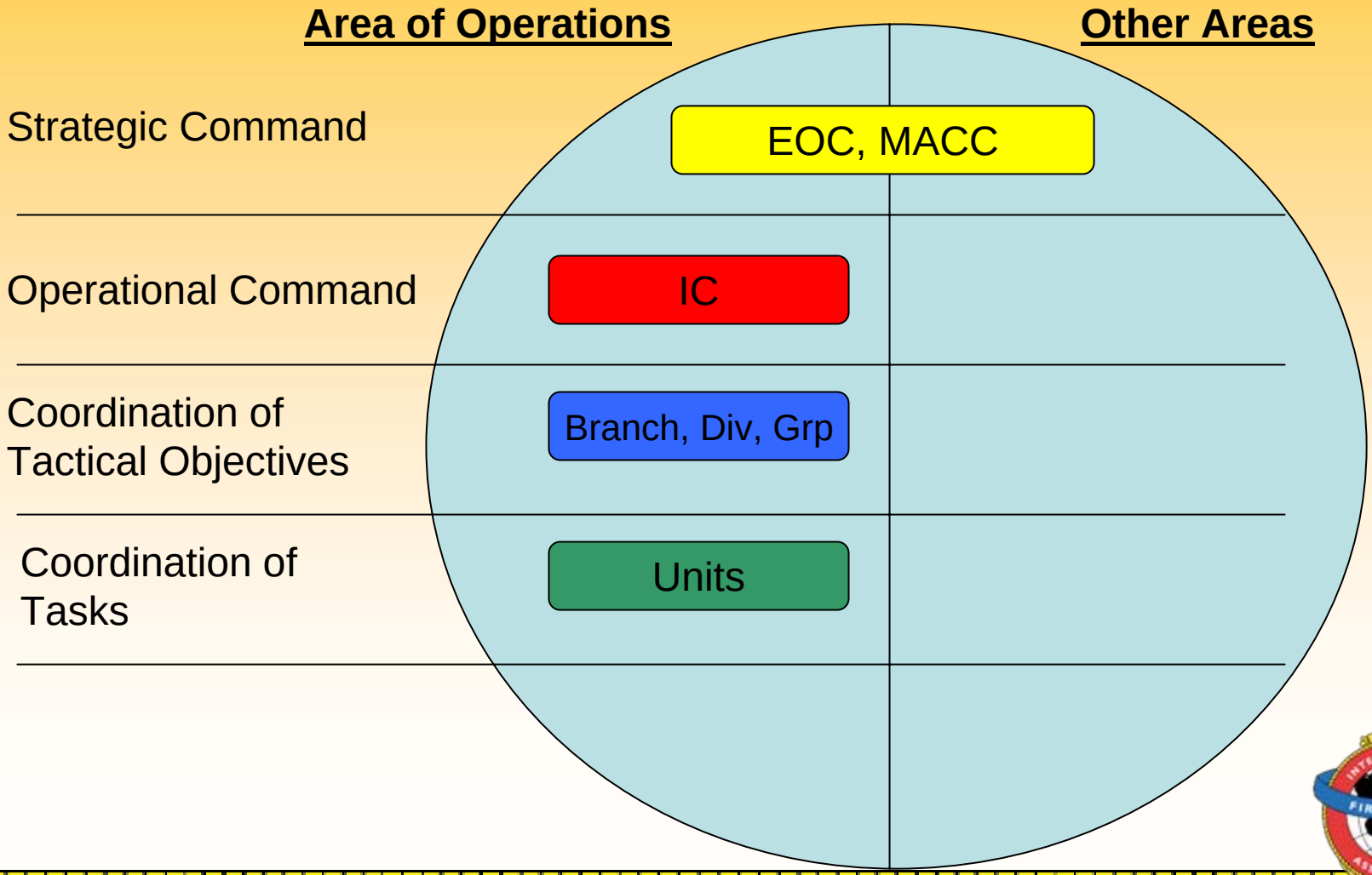
Salt Lake County, Salt Lake City, and the Valley Emergency Coordination Center appear seamlessly integrated despite having separate CAD systems in multiple locations. Sandy City Fire units equipped with GPS stand ready to respond. (Police calls in BLUE, Fire calls in RED).

IAFC MAPView Cont.



Commanders or Area Supervisors can watch all activity from GPS enabled units in their area of operation.

Levels of Command and Control



Technical Interoperability and Command and Control

- **The ability to exchange information within and between levels of command is the basis for decision making - control**
- **Command levels should actively seek specific information required for decision making**
- **How will information exchange be accomplished with or without technological support?**

Impact of Technological Support – Dependency?

- **High levels of technological support can overcome inadequate planning**
  - High technological support
    - Able to develop ad hoc workarounds and improvisation
    - Reduced impact on situational awareness and resource management
  - Low levels of technological support
    - Unable to adapt or improvise
    - Increased impact on situational awareness and resource management
- **High levels of planning and cooperation can overcome low levels of technological support**

Why Interoperability is Important

- **Leverages the effectiveness of available resources**
- **Creates faster planning and execution**
- **Enables your ability to operate in a rapid, coherent, coordinated fashion**
- **Improves operational effectiveness**
- **Increases personnel safety**

Regional Planning for Interoperability

- **Top Priority: Operational Interoperability**
- **Second Priority: Technical Interoperability**
- **Command and Control**
  - Requires a high level of technical support
  - Plan to operate with and without technology
- **Plan for complex, multi-level response operations**
- **Understand the cultural barriers that limit cooperation**
- **Use the power of regional coalitions to overcome barriers.**

Take Action Now!

- **Plan for a regional communications system, back-up communications technologies, multiple channel/system operations**
- **Provide leadership and planning on a regional basis**

IAFC Cont.

- **Strengthen operational interoperability**
  - Work to change attitudes and culture
  - Advocate joint/combined operations as the future of public safety
- **Improve technical interoperability**
  - Make the best of existing equipment & infrastructure
  - Invest in back-up communications capabilities
  - Look for solutions that are currently available, affordable and ready now

Columbine Lessons

QUESTIONS?

Federal Partnership for Interoperable Communications

Virginia Interoperability Conference

October 4-5, 2005

The Federal Partnership for Interoperable Communications (FPIC) serves as a technical and operational advisor within the federal wireless communications community

- Mission—
  - To advance federal wireless communications interoperability by fostering intergovernmental cooperation

- Goals—
  - Provide technical and operational advice from a federal perspective to departments and agencies within the wireless communications community (e.g., SAFECOM, standards development organizations, NIST)
  - Inform federal users about wireless communications equipment, security, operations, standards and best practices
  - Cooperate and further wireless communications interoperability efforts within the Federal Government

- Objectives—
  - Foster partnerships among federal agencies that promotes the exchange of knowledge and resources among members of the wireless communications community;
  - Participate in the creation and maintenance of a federal roadmap to achieve wireless communications interoperability across federal departments, bureaus, and agencies;
  - Actively participate in federal-to-federal wireless communications interoperability activities;
  - Provide organizations that request it federal user input relating to state and local interoperability activities;
  - Develop and articulate a unified FPIC position on standards, security protocols, and spectrum issues; and
  - Serve as the federal wireless communications community's liaison to industry, periodically obtaining technical updates and equipment reviews from vendors.

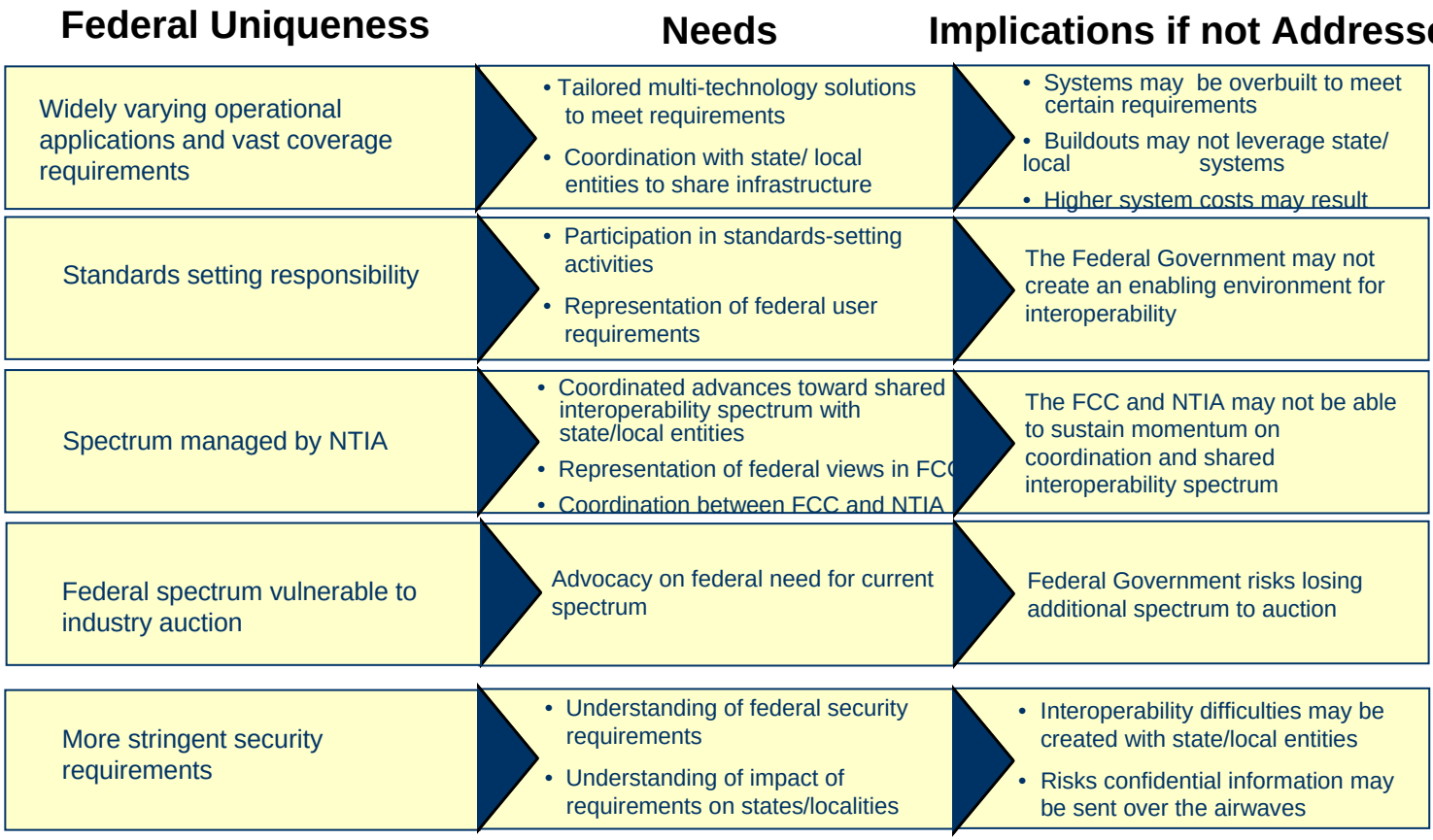
Simply stated— the FPIC allows for the implementation of priorities raised by the entire federal wireless communications community

The FPIC membership consists of 18 federal entities representing over 90 participants

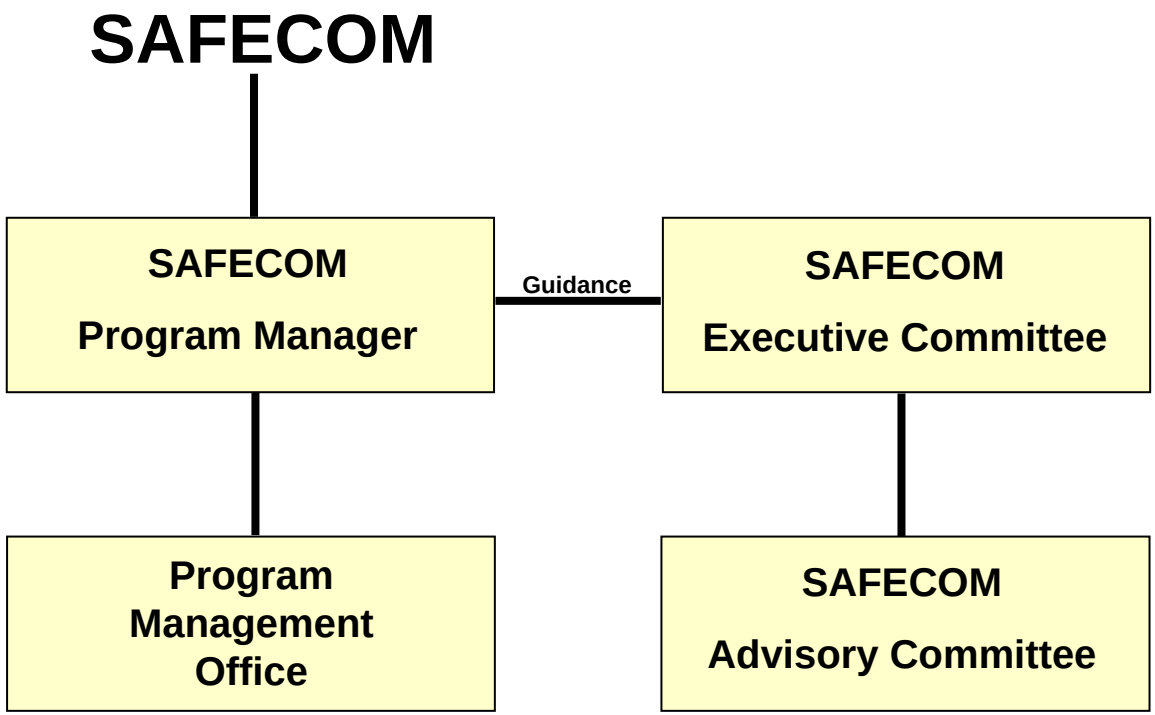
Actively Participating Depts	Active Entities Within Department
Department of Justice (DOJ)	US Marshals Service Bureau of Alcohol, Tobacco, Firearms, and Explosives Wireless Management Office Federal Bureau of Prisons Federal Bureau of Investigations
Department of Homeland Security (DHS)	Immigrations and Customs Enforcement Wireless Management Office Science & Technology Directorate, Off. of Interoperability & Compatibility (SAFECOM) United States Coast Guard Customs and Border Protection Transportation Security Administration Federal Emergency Management Administration
Department of the Treasury (Treasury)	Treasury Inspector General for Tax Administration Internal Revenue Service—Criminal Investigations
Department of the Interior (DOI)	United States Fish and Wildlife Service Bureau of Land Management National Park Service
Department of Energy (DOE)	Spectrum Management Office
Department of Commerce (Commerce)	NTIA—Institute for Telecommunication Sciences NTIA—Public Safety Office
Department of Agriculture (USDA)	Forest Service Office of the CIO

Other Members		
Department of Heath and Human Services (HHS)	Department of State (State)	United States Navy
Environmental Protection Agency (EPA)	United States Postal Service (USPS)	Department of Defense (DOD)
Department of Transportation (DOT)	United States Air Force	Northcom
Department of Veterans Affairs (VA)	United States Army	

The FPIC addresses the unique needs of the federal wireless communications community



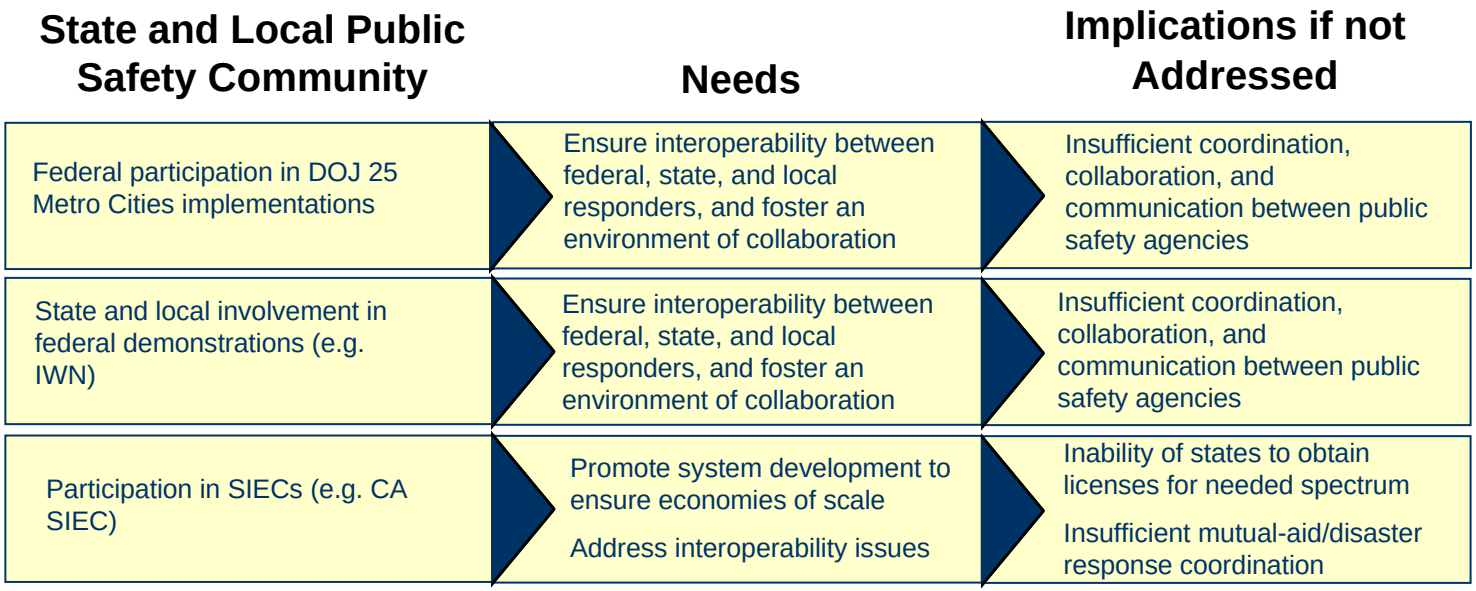
The FPIC provides executive level input to SAFECOM's Executive Committee



The FPIC…

- **Serves as the federal voice to the SAFECOM Program**
- **Is one of three federal voting members on the SAFECOM Executive Committee**
- **Is supported by the DHS Wireless Management Office**
- **May represent on SAFECOM working groups or task groups**

The FPIC responds to requests by state and local wireless communications organizations for federal input on issues affecting the wireless public safety community



The Commonwealth of Virginia has been a participant with the FPIC through its Statewide Agencies Radio System (STARS) Project

Some FPIC activities will require close coordination with SAFECOM activities such as spectrum, security, and standards issues

Technical Solutions

- Participate actively in DOJ 25 Metro Cities
- Implement federal pilots and demonstrations (e.g., Maritime project)
- Develop modules and simulation tools for federal agencies (e.g., RIIPTs)

Tech Asst & Outreach

- Promote greater involvement in SIECs (e.g. Oregon SIEC, California SIEC, and potentially Virginia SIEC)
- Sponsor the Federal Wireless Users Forum (FWUF)
- Facilitate educational and awareness-raising activities

Fed Coord. & Policy

- Coordinate federal interoperability pilots (e.g. IWN)
- Coordinate federal initiatives (e.g., DOI/USDA [Forest Service])
- Plan for future federal interoperability architecture

Spectrum

- Develop spectrum filings on behalf of federal agencies
- Monitor important spectrum issues for Federal Government

Security

- Create security policy requirements, best practices, and standard approaches
- Coordinate federal technical R&D and implementation

Standards

- Participation in TIA and Project MESA
- Coordinate a systematic approach to standards with NIST and NSA
- Test interoperability compliance through ITS Boulder
- Representatives focused on Public Safety: Jim Downes (FPIC), Don Pfohl (SAFECOM)

FPIC Activities

The FPIC holds monthly meetings to brief the membership on FPIC activities, and to solicit input from the federal wireless communication community

The FPIC has four committees that meet monthly to focus on:

- **Standards**: Chair TBD
- **Spectrum**: Merri Jo Gamble (DOJ-WMO) Chair, Charles Hoffman (NTIA) Vice Chair
- **Security**: Harry Reves (FBI) Chair
- **Interoperability:** FPIC Charter Revision Required

The FWUF will now be sponsored by the FPIC as part of the FPIC's outreach programs

The FPIC will sponsor technology workshops to address technical aspects of current and ongoing projects, and to evaluate technologies relevant to the federal wireless communications community

Current FPIC activities

Standards

- Working with SAFECOM and the Project 25 Steering Committee to support more timely interface development, promoting the parallel development of the Inter Sub-System Interface, the Console Interface, and the Fixed Station Interface, in order to avoid wasteful procurement of out-dated technology
- FPIC, in coordination with SAFECOM, is forming a group to test vocoders to provide input to the standard development
- Leading the Logging Recorder Interface Group to ensure federal involvement in standard development

Spectrum

- On April 28th the FPIC filed a response to the FCC Public Notice requesting comment on the spectrum needs of emergency response providers advocating additional allocations within the 700 MHz band for interoperable Federal, State, and local Public Safety needs
- Sponsoring an effort to partner with state and local entities (e.g., NPSTC, Spectrum Coalition) to foster congressional support for additional spectrum in the 700MHz band for broadband applications
- The FPIC filed a response to Notice and Request for Comments on Draft Implementation Guidance for Homeland Security Presidential Directive 12 (HSPD-12)
- Working closely with SAFECOM and the USCG, FPIC is coordinating federal input to address the President's Spectrum Policy Initiative
- Supporting the user-needs subcommittee in:
    - Evaluating Ambient Listening
    - Supporting the Logging Recorder Interface Group
    - Addressing the Silent Radio requirement to ensure federal requirements are incorporated in standard development

Security

- The FPIC responded to NIST, advocating an alternate AES transition plan for Federal tactical communications users to minimize service disruptions and cost expenditures
- Developing a standard definition of end-to-end encryption for wireless communications users to aid in the development of standards and system development

Jim Downes

Chair, Federal Partnership for Interoperable Communications (FPIC)

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Rick Murphy

Vice Chair, FPIC

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Federal Interoperability Initiatives

QUESTIONS?

Breakout Sessions

Break

Narrowbanding and Spectrum Efficiency

David Warner
&
Paul Hoppes
Virginia Information Technologies Agency

The 3 R'S

THE 3 R'S

READING

RIGHTING

RITHMETIC

The New 3 R'S

THE NEW 3 R'S

RULING

RADIO

RESPONSE

The New 3 R'S

RULING

- The first **R** pertains to the spectrum reorganization, breakdown.

RADIO

- The second **R** relates to the spectrum efficiency standards and time table implementation of future radio equipment.

RESPONSE

- The third **R** is the response and/or reaction from the Public Safety community to the first two **R's**

Twas Long Long ago (around the 60's or 70's) in another era that a spectrum efficiency measure took place which effected radio systems in the Private Land Mobile Radio service. Radios had their channel spacing cut and modulation bandwidths significantly reduced to achieve better spectrum efficiency. In fact one manufacturer continued to install special filters in the receiver within a specific make and model of radio as an ongoing effort to comply with these measures. Narrowbanding prior to 1968 referred to having the ability to achieve one voice path with less than one 128 (KHz)[1]. A little further on in the presentation we will see how that relates to today and in the near future.

HISTORY

Many moons later in 1995-96, the FCC adopted a posture that also would promote better use of the spectrum by advocating more advanced technologies. In FCC Docket # 92-235, the FCC would seek to revise the 'Private Land Mobile Radio (PLMR) Services and modify the policies governing them. This became known as the refarming proceedings or 'refarming.'

Objectives of Refarming

- Increase the number of useable or available Channels in all Public Safety VHF (High Band 150-174 KHz) and UHF (450-470 MHz) bands

- Reduce the overall necessary modulation bandwidth requirements (talk or voice path requirement) within each newly created channel and existing channel assignment

How were these objectives accomplished?

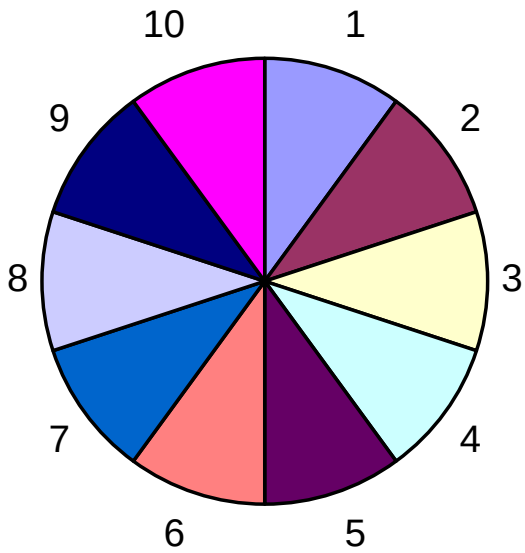
How were these objectives accomplished?

- To increase the number of usable Channels in the VHF & UHF Public Safety spectrums, the FCC placed additional channels in between the existing wideband channels

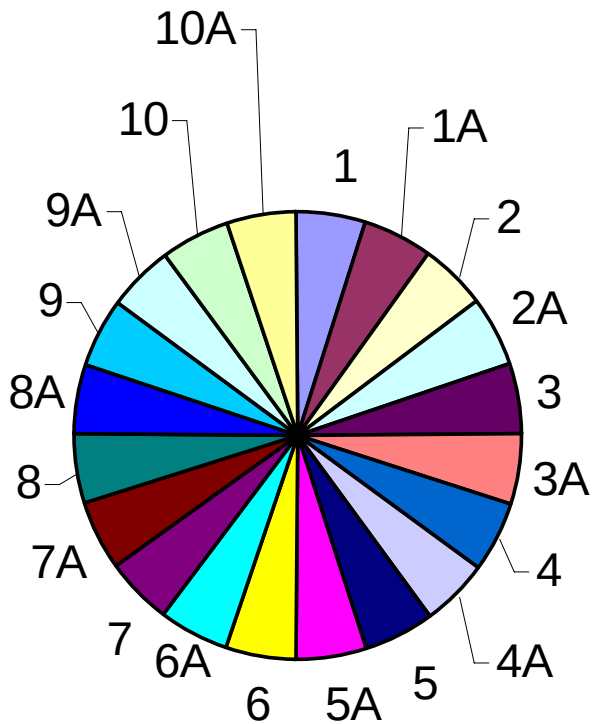
- The result was an approximate net gain of two: or a 100 % increase in available spectrum
- The Spectrum Pie did not increase! Rather the slice given to Public Safety got smaller

SPECTRUM PIES

Before Refarming



After Refarming



How will these objectives be accomplished?

- To facilitate the smaller size channel spacing, the FCC had to reduce the requirements for bandwidth
- The required modulation bandwidth (or talk/voice path) was cut in half

- Future radios were to be designed to operate with smaller channel sizes and reduced bandwidth requirements

Typical Representation of frequencies before and after Refarming (Narrowbanding)	
Pre-Reframing	**Post Reframing**
VHF--MHz	VHF--MHz
154.3700	154.3700
	154.3775
154.3850	154.3850
	154.3925
154.4000	154.4000
	154.4075
----------	----------
155.1300	155.1300
	155.1375
155.1450	155.1450
	155.1525
155.1600	155.1600
	155.1675
Note that the left column increments by 15 and the right column increments by 7.5	

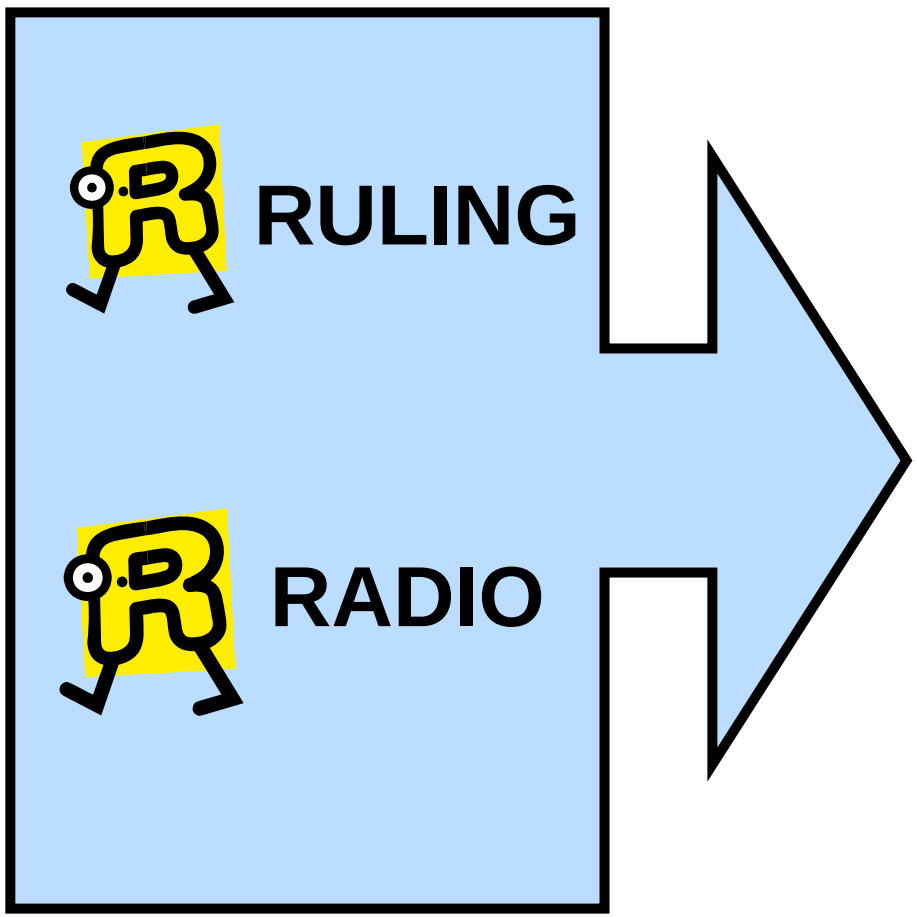
Pre-Reframing	Post Reframing
UHF--MHz	UHF--MHz
453.2250	453.2250
	453.231250
	453.2375
	453.243750
453.2500	453.2500
	453.256250
	453.2625
	453.268750
453.2750	453.2750
----------	----------
460.2250	460.2250
	460.231250
	460.2375
	460.243750
460.2500	460.2500
	460.256250
	460.2625
	460.268750
460.2750	460.2750

Note that the left column increments by 25 and the right column increments by 6.25

Each Blue cell indicates a 12.5 increment between the Blue Cells

Each Red cell indicates a 6.25 increment between the previous

A Synopsis



1. ‘Refarming’ proceedings: The FCC outlined timetables requiring equipment manufacturers to meet certain spectrum efficiency requirements/ standards.
2. Future equipment had to be available within a given timeline, yet the requirement to migrate to the spectrum efficient technologies was not mandated or set forth.

The Remaining 3RD "R"

RESPONSE

- No required or mandated **R**esponse was imposed onto Public Safety
- Lead to a hesitancy to adopt or embrace the new spectrum

Response

1. To facilitate a mandated response, a movement arose to migrate onto more spectrum efficient platforms

Efforts culminated (via the petition for Rulemaking) into 'The Promotion of Spectrum Efficient Technologies On Certain Part 90 Frequencies.' Or FCC WT Docket 99-87

In 1998-99 comments from APCO--Public Safety interest, and concerned parties became forged into a vision for the future of Part 90 frequencies.

Led to the adoption of the 2nd Report & Order and 2nd Further Notice of Proposed Rule Making, of February 2003

Narrowbanding

From the late 90's to early 2K emerged a new buzz word, 'Narrowbanding'

A Synopsis of the 2nd R&O and 2nd FNPRM

Prohibits:

- **New applications for wideband (25KHz channels) licenses after January 2004**
- **Modification of existing 25 KHz licenses beyond existing contours after January 2004**
- **The certification of radio equipment which is capable of operating in a Wideband mode (25 KHz) beginning January 2005**
- **Importation and manufacturing of 150-174 MHz (VHF) and 421-512 MHz (UHF) radio equipment capable of operating in a Wideband mode after January 2008**

Establishes:

- **A mandated migration path for PLMRS systems in VHF & UHF bands; January 2018 for Public Safety and January 2013 for non-Public Safety systems**

FCC Goals vs Public Safety Concern

- The Commission had aggressive goals, directives, and timelines
- Where did that take us and what is the outcome with these initiatives?

Interceding Initiatives and Actions

- APCO and other PLMR users sought to have the FCC impose a ‘stay’ of some of these items. [1] In particular, the items limiting new and modified wideband (25 KHz) license applications were of great concern

[1] See introductory comments and footnotes of FCC Document 03-306; Part of WT Docket 99-87

The FCC View

- The FCC agreed and as a result, the Commission placed a temporary stay of the WT Docket 99-87; 2nd R&O and 2nd FNPRM
- On December 23, 2004 the FCC released a follow up to the 2nd R&O and 2nd FNPRM.
- Where does this leave us?

The Current State

- In concert with the Federal paperwork reduction act of 1995 we now have, the 3rd M&O and 3rd FNPRM&O

How will these changes affect you?

- For Public Safety licensees operating in the PLMR services in like bands, they have to REDUCE the drop dead date for ultimate Narrowband migration FROM January 2018 TO January 2013.
- Note this is earlier than before!

Timeline

- The ruling also stipulates the FCC will no longer allow the manufacture or importation of any VHF or UHF equipment after January 2011.
- Note, this is two years earlier than the January 2013 drop dead date.

Timeline

- The FCC is allowing new wideband license applications until January 2011. After that no new license request will be accepted.
- Wideband modifications will continue to be accepted after January 2011 as long as the modification does not result in a greater contour than pre-existing license authorization.

The Current Rule & It's Impact on You

- With a current FCC authorization, which may not expire until well after 2013, you must nonetheless be compliant.
- The current ruling says that if you are not compliant, turn your radios off.[1]
- Start Planning now!

[1] Substantiated also by Q & A session between APCO 2005 National Conference in Denver, CO with audience and FCC panelist.

Begin Planning Now!

- Begin budgeting
- Inform:
  - Agency supervisors
  - Local City Managers
  - County Board of Supervisors
  - Other decision making representatives

Begin Planning Now!

- Begin getting together a team to examine how much old technology (Wideband 25 KHz technology) you have on hand.
  - Can some of the existing radios simply be switched into a Narrowband mode of operation? (A maximum of one voice path per 12.5 KHz)

Begin Planning Now

- Get your team to consider other impacted areas
  - How will this affect interoperability with your neighbors?
  - Can we coordinate our conversion and our neighbor's conversion as close together as possible?

Other Issues -- Paging

- Paging frequencies and/or paging operations—The FCC exempted Part 90 ‘Paging only frequencies’ from this order.
- Note the term—‘Paging only frequencies’

Other Issues – Mobile Data equipment

- Mobile Data radio equipment would be exempt from this policy [1]

[1] Paragraph 30 of FCC Document 04-292; PR Docket 99-87

Final Comment

- The FCC is still considering the spectrum efficiency requirements of 6.25 KHz technologies.
  - The fate and outcome of a 6.25 KHz technology and its implications to Public Safety was not made within the current 3rd M&O and 3rd FNPRM&O released December 23, 2004 [1]

[1] Paragraphs 42-42 of the 3rd M&O and 3rd FNPRM&O released December 23, 2004.

Narrowbanding and Spectrum Efficiency

QUESTIONS?

Closing Remarks

Chris Essid

Commonwealth Interoperability Coordinator